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## POWER RESOURCES OF HUNGARY

N. I. Romashkin

Hungary's sources of electric power are coal, brown coal, peat, petroleum, natural gas, wood, and water power.

Small amounts of coal are found in the Mecsek area near Pecs. The coal mined in this area is high-value coke coal and deposits are estimated at 200 million tons. Large brown-coal deposits are located in the Esztergom and Salgotarjan regions. Brown-coal deposits are estimated at 3,569 million tons, of which 1,516.6 million tons are industrial coal.

Peat is mined in the Zala-Somogy area, which has reserves of approximately 210 million cubic meters, and in the Hanság region [on the Rába River in southwestern Hungary], which has an estimated reserve of 200 million cubic meters. Peat is also mined in several other areas. Total peat deposits are estimated at 1.1 billion cubic meters, equal in caloric value to 225 million tons of brown coal. Peat is currently used for the manufacture of peat briquettes of 4,600 to 4,800 calories per kilogram.

Petroleum is found in the Bükk Mountains and in Zala County. Petroleum deposits in Zala County are tentatively estimated at 5.2 million tons.

Natural gas is found in Zala County, in the vicinity of Budaörs, near Baja, and east of the Tisza River. Natural-gas deposits of Zala County are estimated at 2,455 million cubic meters.

Hungary's forest areas cover approximately 1,140,000 hectares of land and timber stands are estimated at 62 million cubic meters.

Hungary's water-power potential, if fully utilized, would have a total generating capacity of 130,000 kilowatts. At present, the Hungarian hydroelectric plants have a combined generating capacity of only 8,500 kilowatts, that is, one percent of the total capacity of all power plants of the country.

- 1 -

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Hungarian fuel production is indicated in the following table:

Hungary's Coal, Petroleum, and Natural Gas Production (in 1,000 tons)							
	<u>1937</u>	<u>1938</u>	<u>1943</u>	<u>1946</u>	<u>1947-48</u>	<u>1948-49*</u>	<u>1949-50*</u>
Coal	912.0	--	1,368.0	720.0	--	--	--
Brown coal	<u>8,052.0</u>	--	<u>10,788.0</u>	<u>5,628.0</u>	--	--	--
Total	8,964.0	9,340.0	12,156.0	6,348.0	9,856.0	10,200.0	11,550.0
Petroleum	2.4	37.3	837.0	648.0	496.0	600.0	660.0
Natural gas**	3.6	8.1	70.0	91.2	204.8	---	---

\*Planned

\*\*In million cubic meters

The following table shows electric power production:

Power Production (in million kw-h)	
1937	1,314.4
1938	1,369.6
1946	1,280.0
1 July 1947 to 30 June 1948	1,934.0
1949-50 (planned)	2,000.0
1954 (planned)	4,200.0

The distribution of productive capacity is shown in the following table:

Distribution of Productive Capacity (in 1,000 kw)		
	<u>1937</u>	<u>1938</u>
Public utilities	688.6	700.9
Industrial power plants	<u>165.1</u>	<u>170.9</u>
Total	853.7	871.7

The distribution of public utility works according to source of power in 1938 was as follows:

Plants equipped with steam turbines or steam engines	669,300 kw
Plants equipped with diesel or gas motors	26,300
Hydroelectric power plants	<u>5,200</u>
Total	700,800 kw

- 2 -

SECRET

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SECRET

50X1-HUM

The distribution of production according to types of power plants was as follows:

	Distribution of Production (in million kw-h)	
	<u>1937</u>	<u>1938</u>
Public utilities	1,061.5	1,110.2
Industrial power plants	<u>252.9</u>	<u>259.4</u>
Total	1,314.4	1,369.6

Hungary's largest public utilities include the following plants:

	<u>Capacity</u>	<u>Production in 1938 (in million kw-h)</u>
Tatabanya	30,000 kilowatts	56
Debrecen	--	11
Szeged	--	8.2

The country's largest power transmission system is that of Budapest and the sources of its power were as follows:

	Power Consumption of the Budapest Transmission System (in million kw-h)					
<u>Sources in Power</u>	<u>1937</u>	<u>1938</u>	<u>1946</u>	<u>1947</u>	<u>1948</u>	<u>1949*</u>
Power produced by plants owned by the system	306.6	320.4	269.2	356.1	414.9	116.5
Power purchased from other plants	<u>39.6</u>	<u>39.6</u>	<u>206.2</u>	<u>212.1</u>	<u>168.5</u>	<u>45.9</u>
Total	346.2	360.0	475.4	568.2	583.4	162.4
Number of consumers, in 1,000	260	269	310	318	328	336

\*First quarter only

The first plant of the Matra public utility works, with a capacity of 32,000 kilowatts, is to be placed in operation shortly. The Five-Year Plan provides for the construction of six new power plants, including a hydroelectric plant on the Tisza River with a capacity of 14,000 kilowatts (four generators of 3,500 kilowatts each), which is expected to produce 70 million kilowatt-hours of electricity annually. According to the plan, two additional hydroelectric power plants are to be built on the Tisza and one on the Danube, the latter with a capacity of 55,000-60,000 kilowatts.

The following shows the distribution of the country's electric power consumption in 1938 according to consumer categories:

- 3 -

SECRET

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50X1-HUM

Hungary's Power Consumption  
in 1938

	<u>In Million Kw-h</u>	<u>Percent of Total Consumption</u>
Industry	622.5	45.4
Railroads	121.8	8.9
Agriculture	4.2	0.3
Municipalities	28.7	2.1
Households	129.6	9.5
Used by generating plants	257.5	18.7
Loss in transmission	<u>205.3</u>	<u>15.0</u>
Total	1,369.6	100.0

While during the 50 years preceding Hungary's liberation only 1,300 Hungarian villages had been electrified, the Three-Year Plan provided for the electrification of 500 villages. Under the Five-Year Plan, 300 million forints were appropriated to provide all Hungarian villages with electricity, radio, and telephone service.

That the Hungarian electrotechnical industry is well developed and accounts for a substantial contingent of the country's total machine industry can be seen from the following table:

Output of Hungary's  
Machine Industry in 1947-48  
(in million forints)

	<u>Plan</u>	<u>Actual Production</u>	<u>Quota Fulfilled (%)</u>
Electrotechnical industry	335.0	561.9	167.7
Agricultural machine building	44.0	116.0	263.6
Machine tool building	60.0	69.5	115.8
Transport machine building	454.0	500.0	110.0
Other machine building	<u>859.0</u>	<u>1,004.0</u>	<u>116.9</u>
Total	1,752.0	2,251.4	154.8

Hungary's most important electrotechnical works are the Ganz, Dynamo, Lutz, Agrolux, Szabo & Mateffy, and Standard Works.

The Ganz Electric Works is producing transformers up to 60,000 kilovolt-amperes, electric motors up to 3,000 horsepower, generators up to 80,000 kilovolt-amperes, various types of electrical equipment with ratings up to 220 kilovolts, electric equipment for railroads and mines; cranes; motorboats; and diesel and mine locomotives.

- 4 -

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50X1-HUM

The Ganz Wagon and Machine Works is making diesel motors up to 600 horsepower, water turbines up to 30,000 horsepower, centrifugal pumps with pressures up to 100 atmospheres and with capacities up to 150 cubic meters per hour, etc. The Ganz Wagon and Machine Works produced 78 diesel motors in 1947, and 200 in 1948. The 1949 plan calls for the production of 300 diesel motors.

The Ganz Shipyard produces stationary steam boilers with operating pressures up to 80 atmospheres and with capacities of 100 tons of steam per hour, as well as steamship boilers of various capacities and atmospheric pressure.

The Dynamo Works is making electric motors, transformers, magnetic separators for industrial and agricultural purposes, electric tools, electric equipment for automobiles and trucks, etc. The plant is being equipped with new machines and will shortly begin serial production of small electric motors and electric tools.

The Lang Works is making chiefly steam and hydraulic turbines. Through greater efficiency, the time required to complete a turbine has been reduced from 2 years to 17 months.

The Agrolux Works is making electric meters, electrical household appliances, high-tension apparatus, lighting fixtures, etc. Under the Five-Year Plan, the plant is to be considerably enlarged and modernized. Its output is to be increased by the end of the Five-Year Plan to double that of 1949.

The Szabo & Mateffy Works produces transformers up to 10,000 kilovolt-amperes, transformers for electric soldering, as well as for smelting and other furnaces; magnetic high-tension switches, and low-tension protective switches for motors and transformers up to 3,000 amperes.

The Standard Works is making telephone, telegraph, and radio equipment, including telephone receivers, telephone centrals, automatic telephone centrals, portable amplifiers, measuring instruments, stationary and portable Morse plants, broadcasting stations for long, medium and short waves, two to five-tube radio sets, microphone amplifiers of 3 to 50 watts, and recorders.

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- 5 -

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